

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Tetsujiro KONDO et al.
U.S. Serial No.: Filed Concurrently Herewith
International Appln. No.: PCT/JP01/06594
International Filing Date: 31 July 2001
Priority Date Claimed: 2 August 2000
Title of Invention: DIGITAL SIGNAL PROCESSING METHOD,
LEARNING METHOD, APPARATUSES THEREOF
AND PROGRAM STORAGE MEDIUM

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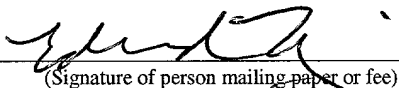
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PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Box Patent Application (35 U.S.C. 111)
Washington, D.C. 20231

Sir:

Before the issuance of the first Office Action, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Please replace the paragraph at page 11, line 19 to page 12, line 8 with the following rewritten paragraph:

In step SP3, if assuming an window function to class tap as “W(K)”, the spectrum processing part 11 calculates multiplication data according to the Hamming window shown by the following equation:

$$W[k]=0.45+0.46* \cos(\pi*k/N)$$

$$<k=0, ..., N-1>$$

Then the spectrum processing part 11 proceeds to step SP4. In this connection, in the multiplication processing of this window function, to improve the accuracy of frequency analysis that will be performed in the following step SP4, the first value and the last value of each class tap formed at this time are made to be equal. Besides, in Equation (4), “N” represents the sample number of Hamming window, and “k” represents the order of sample data.

Please replace the second paragraph at page 17, line 18 to line 22 with the following rewritten paragraph:

Thus, the learner signal generation filter 37 generates learner audio data D37 from the supervisor audio data D30 by predetermined thinning processing, and supplies this to a spectrum processing part 31 and a predictively-operating part extracting part 33, respectively.

Please replace the second paragraph at page 27, line 10 to line 16 with the following rewritten paragraph:

In the aforementioned embodiment, it has dealt with the case where fast Fourier transform is applied. However, the present invention is not only limited to this but also other various frequency analysis means, e.g., discrete Fourier transform (DFT), discrete cosine

transform (DCT), maximum entropy method, method by linear predictive analysis, etc., can be applied.

Please replace the first paragraph at page 28, line 2 to line 10 with the following rewritten paragraph:

Furthermore, in the aforementioned embodiment, it has dealt with the case where ADRC is performed as pattern generating means for generating compressed data pattern. However, the present invention is not only limited to this but also the compression means such as for example differential pulse code modulation (DPCM), vector quantization (VQ). In short, it may be compression means that can represent the pattern of signal waveform by few classes.

IN THE CLAIMS:

Please amend claim 11 as follows:

11. (Amended) A program storage medium for making a digital signal processing apparatus execute a program, comprising:

the frequency analysis step of calculating power spectrum data from a digital audio signal;

the spectrum data extracting step of extracting a part of power spectrum data from said power spectrum data;

the classification step of classifying said digital audio signal based on said part of power spectrum data; and

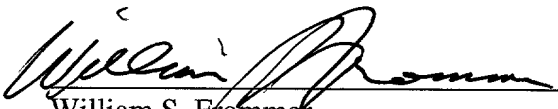
the prediction operation step of generating a new digital audio signal formed by converting said digital audio signal by a predicting method corresponding to said classified class.

REMARKS

The specification has been amended to be consistent and to correct obvious inadvertent errors. Claims 1-26 are in this application. The amendment to the claim 11 is for clarification only. The attached is captioned **"Version with markings to show changes made"** and indicates the changes that have been made herein to the specification and to claim 11.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

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$$<k=0, \dots, N-1>$$

Then the spectrum processing part 11 proceeds to step SP4. In this connection, in the multiplication processing of this window function, to improve the accuracy of frequency analysis that will be performed in the following step SP4, the first value and the last value of each class tap formed at this time are made to be equal. Besides, in Equation (44), “N” represents the sample number of Hamming window, and “k” represents the order of sample data.

Please replace the second paragraph at page 17, line 18 to line 22 with the following rewritten paragraph:

Thus, the learner signal generation filter 37 generates learner audio data D37 from the supervisor audio data D30 by predetermined thinning processing, and supplies this to a spectrum processing part 31 and a predictively-operating part extracting part 33, respectively.

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Please amend claim 11 as follows:

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the prediction operation step of generating a new digital audio signal formed by converting said digital audio signal by a predicting method corresponding to said classified class.